

REMARKS

Claims 1-2 were pending in the above-identified application. By this Amendment, the Applicant has amended claim 1, cancelled claim 2, and added claims 3-22. The newly added claims are supported by the application as originally filed, and do not introduce new matter. Particularly, support for the amendments to claim 1, and newly added claims 6-7 may be found at page 6, lines 6-27. Support for newly added claims 3-5 may be found at page 4, line 20 to page 5, line 14. Support for claim 8 may be found at Figure 1C. Support for claim 9 may be found at page 8, lines 15-19. Support for claims 10-12 may be found at page 10, lines 20-31. Support for claims 13-18 may be found in the Example 1 on page 11-12. Claims 19-22 include the limitations of claims 1-18, support for which may be found as discussed above. Accordingly, entry of the amendments to claim 1 and newly added claims 3-22 is respectfully requested.

Claim Rejections Under 35 U.S.C. § 103

In the Office Action dated December 1, 2004, the Examiner rejects claims 1-2 under 35 U.S.C. §103(a) over U.S. Patent No. 6,215,630 (Schultz) in view of U.S. Patent No. 6,503,627 (Nimi). The Applicant respectfully traverses the rejections, and asserts that the claims pending in the present application are patentable over the art of record for at least the reasons stated below.

Schultz provides magnetic transducers produced by depositing diamond-like carbon on an insulating layer and a layer of magnetic material onto the diamond-like carbon. The insulating layer may be deposited onto a base magnetic layer so that the insulating layer and the diamond-like carbon layer form a gap for a magnetic transducer. Col. 1, lines 30-51. Nimi provides an antistatic hard coat film that is used with displays to prevent electrostatic deposition of foreign materials on the surface of the display. The antistatic film includes a transparent conductive layer that has a surface resistivity of not more than 10^{12} ohms/cm. Col. 1, line 49-col. 2, line 4.

In contrast, the present invention provides methods and systems for measuring stress on structure with percolation-based sensors. Particularly, with respect to independent claims 1, 3, 19, and 21, and the claims dependent thereon, methods and systems are provided for measuring stress on a substrate based on a change in the resistivity of a diamond-like metal-carbon coating or film. The conductive diamond-like carbon includes a metal at a concentration for the conductive coating or film to exhibit conductivity percolation with an

applied stress. Neither Shultz nor Nimi disclose or otherwise suggest percolation based stress sensors for measuring stress based on a change in the resistivity of a diamond-like metal-carbon material.

The Examiner asserts that "Shultz discloses a diamond-like carbon magnetoresistive transducer with features of the claimed invention including the process of measuring stress represented by magnetic effects and teaching the provision of various coating structures with a conductive coating applied to an insulating coating." The Applicant respectfully disagrees with the Examiner. Shultz does not disclose or suggest measuring stress with the diamond-like carbon coating. Shultz merely uses the diamond-like carbon coating in the gap between magnetic layers to dissipate heat and to block etchants from delaminating the transducer during subsequent processing. Col. 3, lines 14-26.

Additionally, Shultz does not measure a change in the resistivity of the conductive layer (the magnetic layer(s)), which is not a diamond-like carbon material. Indeed, Shultz does not even disclose measuring a change in the resistance of the conductive layer. The Applicant respectfully points out that the resistivity of a material is not the same as the resistance of an item made from the material. The resistance of an article is a function of the resistivity of the material and the dimensions of the item. Percolation based sensors in accordance with the present invention are possible with a sensing film or coating that includes a diamond-like metal-carbon atomic scale material that has a metal concentration for the material to exhibit conductivity percolation with an applied stress. Shultz does not disclose or suggest using a diamond-like carbon material with any metal concentration. Rather, Shultz requires that the diamond-like carbon material have a high resistivity as pointed out by the Examiner with reference to col. 4, line 32. Adding metal to the diamond-like carbon layer would decrease the resistivity of the material contrary to Shultz.

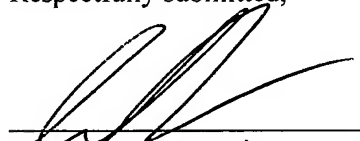
The Examiner further asserts that Nimi discloses "an antistatic hard coat film with features of the claimed invention include the process of measuring the [resistivity] of conductive coating" with reference to col. 10, line 15. The applicant disagrees with the Examiner on this point as well. Nimi does not disclose measuring a change in resistivity of a material in accordance with the present invention. Nimi merely states that the resistivity of the conductive material is measured at a particular time during the manufacture of the coating, *i.e.*, at the time the hard coat layer is formed onto the transparent conductive layer. Col. 10, line 14-16.

The dependent claims are patentable for additional reasons. While deemed unnecessary to argue these additional reasons at this time, given the arguments presented above, the Applicant reserves the right to present such arguments should it become necessary or desirable to do so. Moreover, the Applicant traverses any and all rejections in the Office Action where the Examiner implicitly or explicitly asserts official notice of that which is known in the prior art and directs the Examiner to cite a reference that supports his position.

For the above reasons, the Applicant submits that the invention as claimed is patentable over the references cited by the Examiner. Accordingly, reconsideration and allowance of pending claims 2-26 is respectfully solicited. The Applicant invites the Examiner to contact the Applicant's undersigned representative to expedite prosecution.

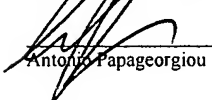
Respectfully submitted,

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Appendix A – Substitute Specification – Clean Version